

research like the transmission of plant pathogens by homopterous vectors, a tri- or even biennial updating of a review is certainly not unwarranted, let alone the fact that the chapter under discussion (written by one of the editors—K. F. Harris) has been condensed into a mere 12-page synoptic review. At any rate, it would be utterly inconceivable to omit, for whatever reason, a chapter on aphids and leafhoppers from a textbook entitled “Vectors of Plant Pathogens.”

A marked improvement in the References lists concluding each chapter, as compared to the two previous volumes of the series, is the providing of full titles of the cited publications. This will undoubtedly be very much appreciated by all users of the book.

In a reference book like this, comprising 17 individual contributions of different authors, a good index, going down to exhaustive detail, is more than essential. The challenge was indeed well taken up here in the form of a 29-page index, listing some 2,800 items.

Thus, the careful choice of top expert authors, coupled with a good measure of skillful judgment exercised by the editors, and the highly professional presentation on the part of the publishers, have all together resulted in a most welcome, comprehensive and updated compilation of core reference and background information on its subject. It will doubtlessly be indispensable in providing the most up-to-date handbook on vector transmission of plant disease agents currently available. As a university instructor charged with the teaching of a course on this very subject, I can state with a great deal of gratitude that the book has definitely made my task very much easier now. Without any hesitation I thoroughly recommend this book to specialists and non-specialists alike who have an interest in vector-related plant pathology, and/or phytopathogen-related entomology, whether it be from the research or teaching point of view.

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Handbook of Plant Virus Infections: Comparative Diagnosis. E. Kurstak, ed. Elsevier-North Holland. 944 pp. \$192.75.

Plant virus infections can spread in various ways and the most prevalent is by means of insect vectors. Therefore the subject of this treatise is of special interest to entomologists. Hundreds of plant virus diseases have been described all over the world, but the causative viruses were often inadequately identified and, in many instances, the viral nature of the diseases not properly ascertained. In fact, more than 200 viruses, incompletely characterized by 1981, remain ungrouped, and only 23 virus groups and 2

families of viruses have been accepted as properly characterized. There exists a real need for a comprehensive text that would facilitate the proper diagnosis of plant virus infections, and the present volume is the first attempt to fill the existing gap.

Many of the basic procedures used for the description and diagnosis of viruses are described in detail by the contributors of this book. In most instances the natural means of transmission is highly diagnostic, but there are certain virus groups with specific vectors, others where vectors are as yet unknown, and still others transmitted by seed, pollen, or by vegetative means. The comprehensive contents of this book are divided into 6 parts. The first deals with plant virus taxonomy, the second with non-enveloped RNA viruses, the third with enveloped RNA viruses, the fourth with elongate RNA viruses. The fifth part deals with DNA viruses and the last one with viroids.

Entomologists will be especially interested in the chapters in which insect and other invertebrate vectors and their interactions with plant-pathogenic viruses are presented. Chapter 2 describes maize chlorotic dwarf and its only natural leafhopper vector *Graminella nigrifrons*. The third chapter deals with the identification of Tymoviruses, transmitted by beetles. The Tombusviruses (Chapter 4) have but a few known natural vectors, such as the flea beetles of the genera *Phyllotreta* and *Psilliodes* for turnip crinkle. Chrysomelid vectors, *Lema melanopa* and *L. lichensis*, as well as *Ceratoma trifurcata* transmit southern bean mosaic virus (Chapter 5). Luteoviruses are transmitted by more than a dozen specific aphid vectors and the persistent virus-vector interaction accounts for the distribution of infected plants in the field (Chapter 6). Chapter 8 deals with Comoviruses, transmitted mainly by chrysomelid beetles. There are very good electron micrographs of the pea enation mosaic virus (Chapter 10) but none of the virus in its major aphid vector *Acyrtosiphon pisum*, in which the virus is known to multiply. The ubiquitous Cucumoviruses (Chapter 11) are transmitted in nature by some 75 aphid species. Their biological aspects and vector control have been described in great detail. Among the Ilarviruses (Chapter 13) one, tobacco streak, is transmitted by a thrips, *Franklinella* sp., another (Prunus ringspot) by a mite, *Vasates fockeni*. Alfalfa mosaic virus (Chapter 14) is transmitted by many aphid species in the nonpersistent manner. On the other hand, Reoviruses (Chapter 15) are transmitted biologically by leafhoppers and planthoppers. This chapter contains detailed tables concerning vector species as well as outstanding electron micrographs by Prof. E. Shikata of Hokkaido U., Japan, of virions in fatbody cells of *Nephotettix cincticeps* infected with rice dwarf virus, and of *Unkanodes albifascia* with rice black-streaked dwarf virus. The use of immune electron microscopy for the identification of plant reoviruses is among the highlights of this chapter. In the following chapter (No. 16) there is an excellent tabular presentation of

rhabdovirus vectors, and of the world-wide distribution of the diseases. Electron micrographs of virions in cells of infected plants illustrate this chapter, prepared by R. I. B. Francki (Australia), E. W. Kitajima (Brazil) and D. Peters (Netherlands), the three foremost authorities on these ubiquitous viruses. The thrips-borne tomato spotted wilt virus is described in Chapter 17. The diagnosis of aphid-borne Potyviruses is in Chapter 23. The plant DNA Caulimoviruses (Chapter 25) are transmitted by *Myzus persicae* and *Brevicoryne brassicae* aphids. Some of the Geminiviruses (Chapter 26) have vectors belonging to the cicadellid leafhoppers, such as *Orosius argentatus* and *Nesoclutha pallida*, while others are transmitted by whiteflies, *Bemisia tabaci*.

The constant growth of the world population increases the need for more food and fiber, and in light of this it is important to reinforce current knowledge of plant virus diseases and of plant virus-vector interactions, so as to control the numerous diseases more efficiently. Plant pathologists, entomologists, teachers and students will find this large volume to be an outstanding source of information. Because of its cost, however, it will most likely be limited to libraries at colleges and universities.

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Insects and Other Invertebrates of the World on Stamps. William E. Stanley, ed. Biology Unit, American Topical Association Handbook No. 98. 140 pp. \$10.—ATA, 3306 North 50th St., Milwaukee, WI 53216.

This 140-page handbook is the only complete data source on insects and other invertebrates, illustrated on stamps of the world. It brings together in a concise form in three sections (1) butterflies and moths, (2) other insects and (3) other invertebrates. Taxonomic listings by phyla, classes, subclasses, orders and families, with Latin and common names, as well as country listings follow the style of earlier biological stamp handbooks issued by ATA. The checklist specifies the country, date of issue, Scott, Minkus or Stanley Gibbons stamp catalog numbers, face value, Latin name and authority, as well as an indication of whether the reproduction is in natural colors. This little handbook will be a must for entomologists who collect insects on stamps.

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